

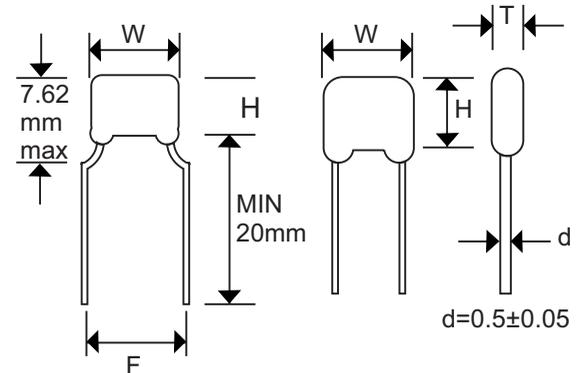
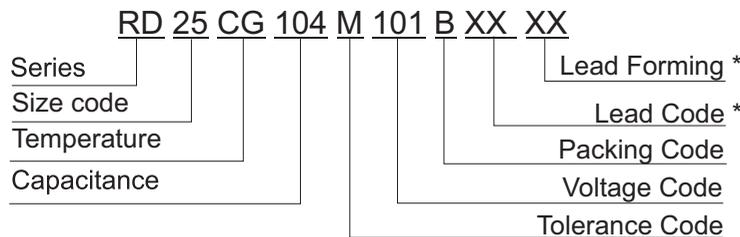
INTRODUCTION

Radial Leded Multilayer Ceramic Capacitors are made with a superior epoxy coating for moisture and mechanical protection. The small size is suitable for a wide range of applications, including: data processing, telecommunications, instrumentation, and industrial controls.

FEATURES

- Epoxy Coating
- Minature Size
- Auto Insertable
- Operating Temperature Range -55 to 125°C

PART NUMBER EXAMPLE



* omit for standard leads & taped product

SIZE CODE & CAPACITANCE RANGE

Size Code	Dimensions (mm)			Voltage Vdc	Voltage Code	C0G/NPO (pf)	X7R (µf)	X5R (µf)	Y5V (µf)	Z5U (µf)
	W	H	T							
RD2 *	4.0	4.0	2.5	6.3V	060			1.50 ~ 10.00	4.70 ~ 22.00	
				10V	100			0.33 ~ 4.70	2.20 ~ 10.00	
				16V	160		0.22 ~ 2.20	0.15 ~ 2.2	1.00 ~ 4.70	
				25V	250		0.10 ~ 1.50	0.10 ~ 1.0	0.47 ~ 2.20	0.47 ~ 2.20
				50V	500	1~10,000	0.00022 ~ 0.33	0.10 ~ 1.00	0.1 ~ 1.00	0.1 ~ 1.00
				100V	101	1~4,700	0.00022 ~ 0.10			
				250V	251	100~2,700	0.001 ~ 0.033			
RD3 *	5.0	5.0	3.0	6.3V	060			10.00 ~ 22.00	47 ~ 100.0	
				10V	100			6.80 ~ 10.00	22 ~ 47.0	
				16V	160		0.30 ~ 4.70	1.5 ~ 10.00	10 ~ 22	
				25V	250		0.68 ~ 2.20		4.7 ~ 10	
				50V	500	3,900~33,000	0.47 ~ 1.00		2.2 ~ 4.7	
				100V	101	3,900~10,000	0.033 ~ 0.47			
				250V	251	3,300~8,200	0.015 ~ 0.15			
	500V	501	100~3,300	0.001 ~ 0.033						

* 2 = 2.5mm ± 1mm Lead Spacing, F Dimension

* 5 = 5.0mm ± 1mm Lead Spacing, F Dimension

Note : Contact RFE for capacitance and voltage combinations not shown above

CAPACITANCE CODE

Code	1R0	100	330	221	102	222	103	224	105
Capacitance	1.0pF	10pF	33pF	220pF	1000pF	2200pF	10000pF	220000pF	---
	---	---	---	0.00022µF	0.001µF	0.0022µF	0.01µF	0.22µF	1.0µF

■ TOLERANCE CODE

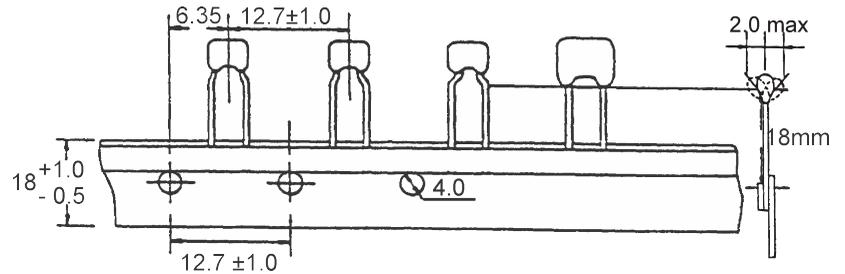
Symbol	Cap.	Tol.
C	±0.25pF	
D	±0.5pF	
F	±1%	
G	±2%	
J	±5%	
K	±10%	
M	±20%	
Z	±80%, -20%	

■ TEMPERATURE COEFFICIENT

Code	Temp. Charact.	Temperature Range	Capacitance Change
CG	C0G/NPO	-55 ~ 125°C	0±30 ppm/°C
X5R	X5R	-55 ~ 85°C	±15°C
XR	X7R	-55 ~ 125°C	±15°C
YV	Y5V	-30 ~ 85°C	+22°C, -82%
ZU	Z5U	+10 ~ 85°C	+22°C, -56%

* See other RD Series for X5R, X7R, Y5V, Z5U

■ TAPING & PACKAGING

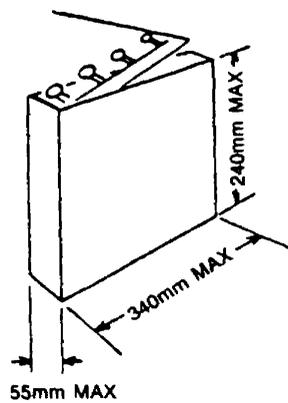


■ PACKAGING CODE

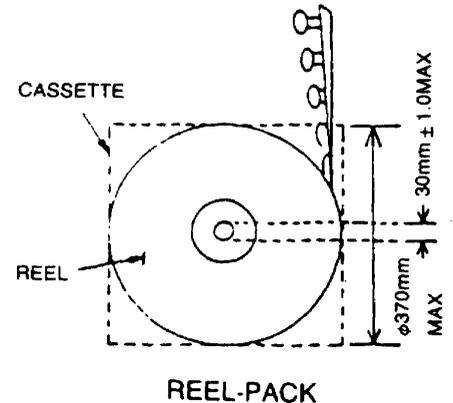
Code	Style	Quantity
B	BULK	1000
A	AMMO	3000
R	REEL	3000

■ Lead Forming

Code	Stand off forming
KO	Kink Out
KI	Kink In



AMMO BOX



REEL-PACK

■ LEAD LENGTH EXAMPLE (Bulk Only)

Code	20	04	10	16	30
Length (mm)	standard	4±1	10±1	16± ^{1.5} ₁	30±3

ELECTRICAL CHARACTERISTICS

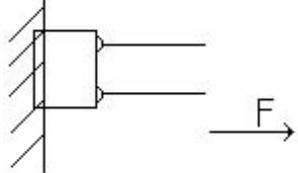
C0G/NPO

Parameter	Specification	Measuring Condition
Capacitance	With the specified tolerance	Shall be measured at 25°C ± 2°C at the frequency and voltage
Q	$C \geq 30\text{pF}: Q \geq 1000$ $C < 30\text{pF}: Q \geq 400 + 20 \times C$ (C is nominal capacitance)	$C \leq 1000\text{pF}@1\text{MHz} \pm 20\%, 1 \pm 0.2\text{Vrms}$ $C > 1000\text{pF}@1\text{KHz} \pm 10\%, 1 \pm 0.2\text{Vrms}$
Withstanding Voltage	No defects	Applied voltage : Rated voltage × 2.5 100V ~ 500V Rated voltage(over) × 1.5 Duration : 1 to 5 sec. The charge/discharge current is less than 50mA
Insulation Resistance	More than 10GΩ or 500MΩ · μr whichever is less 16Vdc product : More than 10GΩ or 100MΩ · μr whichever is less	Apply rated voltage for 1 minute at 25°C ± 2°C and 70%R.H.max. 16Vdc product : Measurement voltage is 25Vdc

STORAGE

1. The storage conditions <40°C, <70% R.H.
2. After opening the package, please store in desiccators.

ENVIRONMENTAL AND TEST CHARACTERISTICS

Parameter	Specification	Measuring Condition
Strength of termination	Termination not to be broken or loosened Force : 2 LB min. Keep time : 10 ± 1 sec.	
Solderability of leads	Lead wire to be soldered vertically up to the coating end point. At least 75% of lead surface is covered	Solder temperature: 260 ± 5°C Dipping: 2 ± 0.5 sec. (Containing Ag 2~5%) (Flux shall be used)

■ ELECTRICAL CHARACTERISTICS

C0G/NPO

Item	Specification	Measuring Condition	Measuring Condition																
		Resistance to Soldering heat	Thermal shock																
ΔC	$\pm 2.5\%$ or $\pm 0.25\text{pF}$ (Whichever is greater)	The lead wire is immersed in the melted solder 1.5mm to 2mm from the main body at $260 \pm 5^\circ\text{C}$ for $10 \pm 0.5\text{sec}$																	
Q	$C \geq 30\text{pF}$: $Q \geq 1000$ $C < 30\text{pF}$: $Q \geq 400 + 20 \times C$ (C is nominal capacitance)	Let sit at room temperature for $24 \pm 2\text{hrs.}$ then measure.	Perform the five cycles according to the four heat treatments listed in the following table. Remove and let sit at room temperature for $24 \pm 2\text{hrs.}$, then measure.																
I.R.	More than $10\text{G}\Omega$ or $500\text{M}\Omega \cdot \mu\text{F}$, whichever is less. 16V dc product: More than $10\text{G}\Omega$ or $100\text{M}\Omega \cdot \mu\text{F}$, whichever is less.	Perform the initial measurement.																	
		<table border="1"> <thead> <tr> <th>Temp. ($^\circ\text{C}$)</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>Min. Operating Temp.</td> <td>Room Temp.</td> <td>Room Temp.</td> <td>Max. Operating Temp.</td> <td>Room Temp.</td> </tr> <tr> <td>Time</td> <td>30</td> <td>15</td> <td>30</td> <td>15</td> </tr> </tbody> </table>			Temp. ($^\circ\text{C}$)	1	2	3	4	Min. Operating Temp.	Room Temp.	Room Temp.	Max. Operating Temp.	Room Temp.	Time	30	15	30	15
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Min. Operating Temp.	Room Temp.	Room Temp.	Max. Operating Temp.	Room Temp.															
Time	30	15	30	15															
		Perform the initial measurement.																	

Item	Specification	Measuring Condition	Measuring Condition
		Moisture resistance (Steady state)	High temperature loading
ΔC	(Whichever is greater) $\pm 5\%$ or $\pm 0.5\text{pF}$ (Moisture resistance) $\pm 3\%$ or $\pm 0.5\text{pF}$ (High temperature loading)	Apply the rated DC voltage at $40 \pm 2^\circ\text{C}$ and 90 to 95% R.H. for 500^{+24} hrs.	Apply 200% of the rated DC voltage for 1000^{+48} hrs. at the maximum operating temperature $\pm 2^\circ\text{C}$. Remove and let sit at room temperature for $24 \pm 2\text{hrs.}$, then measure.
Q	$C \geq 30\text{pF}$: $Q \geq 350$ $10\text{pF} > C < 30\text{pF}$: $Q \geq 275 + \frac{5}{2} \times C$ $C \leq 10\text{pF}$: $Q \geq 200 + 10 \times C$ (C is nominal capacitance)	Remove and let sit at room temperature for $24 \pm 2\text{hrs.}$, then measure.	The charge/discharge current is less than 50mA.
I.R.	More than $1000\text{M}\Omega$ or $50\text{M}\Omega \cdot \mu\text{F}$, whichever is less. 16V dc product: More than $1000\text{G}\Omega$ or $10\text{M}\Omega \cdot \mu\text{F}$, whichever is less.	Perform the initial measurement.	Perform the initial measurement. *100% for 100V~500V over.

- Withstanding voltage: No defects
- Exterior: No abnormalibus